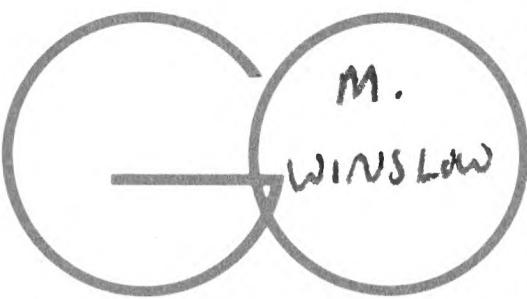


THE ZOO



ER

Volume 1, Number 1

April/May 1972 Price .35



Published by the Friends of the National Zoo

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Published by
Friends of the National Zoo
National Zoological Park
Washington, D.C. 20009

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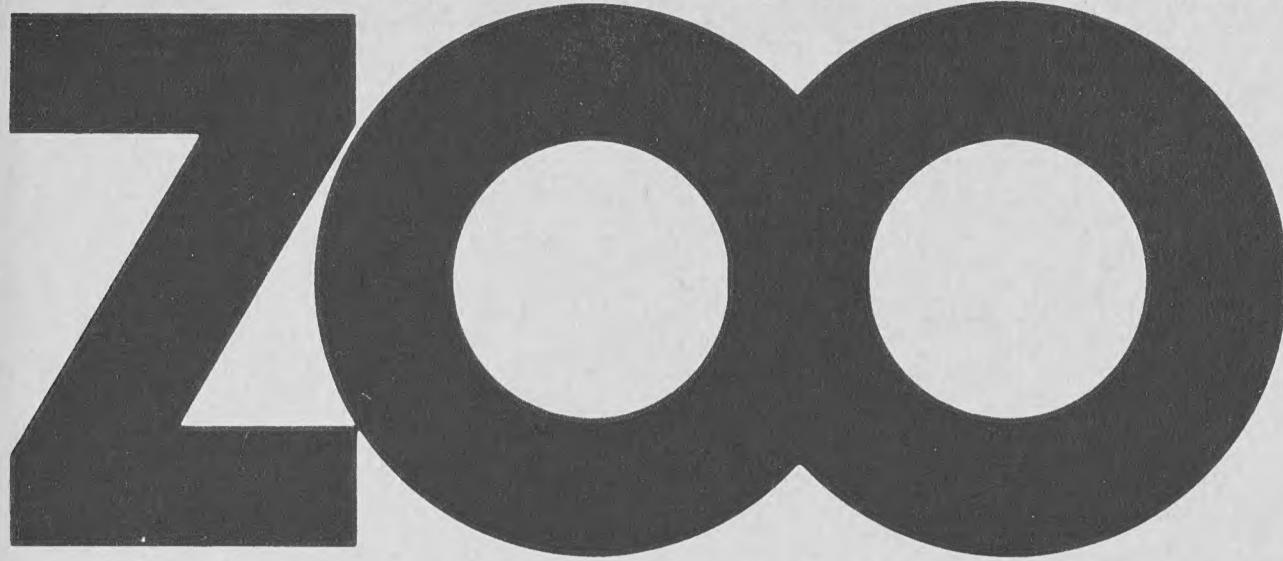
Cover photograph and photograph on
page 4 by Donna Grosvenor; other
photographs by Mark Gordon. Draw-
ing on page 3 by Margaret Brown.

THE ZOOGOER is published bi-
monthly and copyrighted © by the
Friends of the National Zoo, c/o
National Zoological Park, Wash-
ington, D.C. 20009. Application pending
for second-class mailing permit at
Washington, D.C. Rate in the
United States \$3 a year. Vol. 1, No. 1.



THE ZOOGOER is a new bi-monthly publication
of the Friends of the National Zoo and replaces
the quarterly publication, *Spots and Stripes*. With
THE ZOOGOER, the Friends hopes to provide
for its membership an up-to-date report on new
animals and exhibits at the National Zoological
Park and in-depth articles on the natural history
and behavior of animals at the Zoo. All of the text
and photographs will be keyed to the centerfold
map in hopes of making a trip to the Zoo a more
interesting, educational, and enjoyable adventure.
THE ZOOGOER will also be on sale at the Friends'
Window Shop and kiosk as a current guide to
points of interest at the Zoo.

Friends of the National



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Membership in the FRIENDS allows you many benefits that will make your zoo-going more enjoyable and educational.

The membership of the FRIENDS supports and provides volunteer services to the public and the Zoo through such activities as Tour Guiding for public school classes, free information booths on the Zoo grounds, maternity watches for pregnant Zoo animals and Financial support for wildlife conservation and scientific research from the profits of its Window Shop, Kiosk, Balloon Booths and Trackless Train operations.

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Rare Twins at the Zoo Nursery

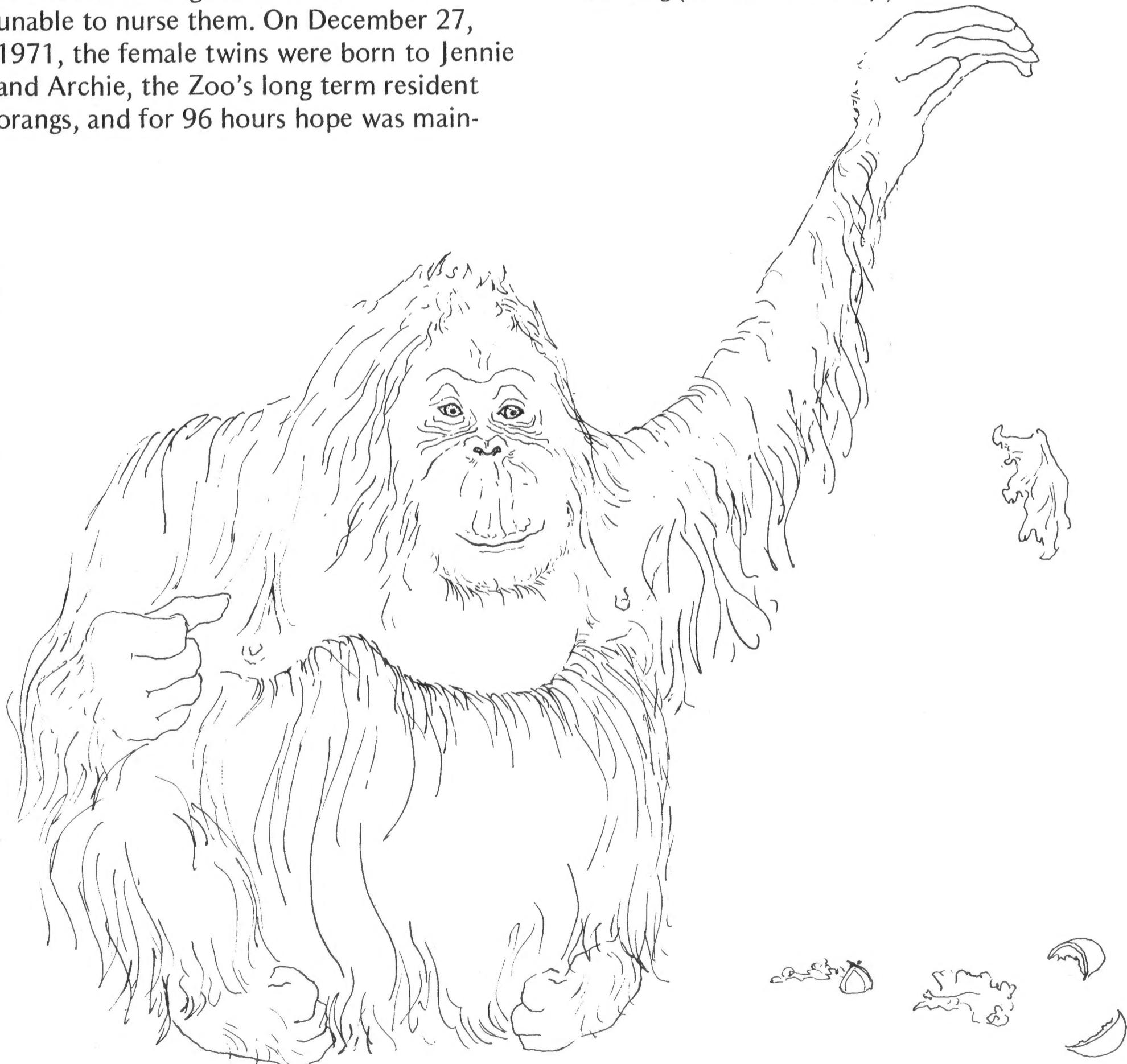
by Katie Kazan

The National Zoological Park began the new year with a new problem: how to care for infant twin orangutans whose mother was unable to nurse them. On December 27, 1971, the female twins were born to Jennie and Archie, the Zoo's long term resident orangs, and for 96 hours hope was main-

tained that Jennie would lactate; in all other respects she was a model mother, playing with her babies, kissing their faces and running her lips over their bodies. Finally it was felt that further delay in feeding would risk the health of the infants and on December 31st they were taken from her and brought to the nursery in the Zoo's Hospital and Scientific Research Building.

Now over three months old, the twins are thriving under an around-the-clock foster parent program. Named Malati and Mawar (the Indonesian words for Jasmine and Rose, respectively), they are the third known orang twins to be born in captivity, the others having been born in Munich, Germany, and Seattle, Washington. Since

Artist Margaret Brown's impression of Jennie, the mother of the Zoo's orangutans twins. Jennie is with the other great apes in the Small Mammal Building (*number 15 On map*).





orangs, like all apes, have a prolonged infancy, they will require nearly constant attention for many months and will not make their first appearance before the general public until the Friends of the National Zoo's Zoo Night on June 9, 1972.

With their first feeding, which took place within one-half hour of separation from Jennie, detailed notes were begun concerning the care and behavior of the twins. As orangs hand-raised at this zoo in the past have proven to be allergic to dairy products, the babies were introduced to a soy-based baby formula, Prosobee. As a substitute for the nests of branches and leaves that their mother would share with them in the wild, a human baby's crib was purchased. A 24-hour feeding schedule was devised to attend to the babies' needs on a regular basis.

An unfortunate hindrance to the tasks of the foster parents is that very little is known about the behavior of this species in the wild; one of the seemingly mandatory remarks in any written account of orangs' natural behavior is that the adults are shy creatures and prefer solitude. On top of this, their numbers in their native Borneo and northwestern Sumatra are exceedingly small; and, though studies have begun in the last few years, there is as yet virtually no information available pertaining to natural maternal care, compared to the amount available on more sociable primates. It is not known, for example, whether orangs in the wild eat meat, as chimpanzees occasionally do, and if they do, at what age they begin. At the nursery the twins are already being served Gerber's Strained Beef and Vegetables. In cases such as this, keepers must proceed cautiously, being sensitive to the first hints of trouble arising from change of diet, schedule, or climate. Thus nursery care for the orangs is a combination of two parts premise and one part intuition. The temperature in the dense forests of Borneo and Sumatra varies according to the season and time of day, but at the nursery the infants are subject to a fairly steady 74 de-

gress. In the wild, orang babies would have constant contact with their mother during the first year of their lives, depending upon their extraordinarily strong grip to cling to the mother as she climbs and travels. As in all primates but man, the big toe is opposable; and the twins' ability to cling is nearly as strong with the feet as with the hands. In the nursery, where practicality must dominate, the twins are handled only during feeding times and must be content with soft blankets to cling to during sleeping hours.

Sleeping hours are another unknown in the wild, but the Zoo's twins sleep about 18 out of 24 hours and are not awakened by loud and sudden noises. There is little information available as to the cleaning care mother orangs give to their young in natural surroundings; at the nursery, where necessity demands that the twins wear diapers, their bottoms are washed many times each day and their hands, faces, and bodies less frequently. Susceptibility to disease is also unknown; and the Zoo in a rather-be-safe-than-sorry policy, strictly limits the number of visitors to those on official business, and they are asked to wear surgical masks.

Those who are permitted to visit the nursery are inevitably struck by the similarities of the twins to human babies. The similarities begin even before birth, as the gestation period of orangs is nine months. They show greater muscular development at birth, but otherwise they are quite as helpless and dependent as human babies. Physically, the body is thinner; the limbs are lengthened, especially the arms, and the hands and feet are remarkably lengthened. The babies do not cry like human babies, but whimper or chirp when hungry and are capable of a loud scream when frightened. Their eyes begin to focus well at about two months.

Those who are worried that the twins will have outgrown their baby-ness by the time they are displayed in June need not fear. Though they should have upper and lower teeth by that time, they will most likely weigh under ten pounds and will be at a playful crawling stage—not yet mischievous, no longer helpless. ■

Feeding time at the nursery. By now the twins have graduated to applesauce and baby cereal.

Mammals

Giant Pandas at the National Zoo

As this magazine goes to press, we have received word that the National Zoological Park is to provide a home for the two giant pandas presented to the people of the United States by the People's Republic of China. The pandas are scheduled to arrive in April and will be housed in quarters previously used for hoofed stock (*number 10 on map*).

Although they are among the most famous and best loved of all animals, giant pandas (*Ailuropoda melanoleuca*) occupy a relatively small area of impenetrable bamboo forest in the southwest area of China near the Tibetan border, and their habits in the wild are not well known. They were not discovered by Western science until 1869, and no captive panda appeared outside China until 1936, when an infant specimen arrived in New York. This panda was eventually acquired by Chicago's Brookfield Zoo, where two more giant pandas have been exhibited since then; the last of these set a captive longevity record of almost 14 years, dying in 1953. There have been six other giant pandas in this country previous to the National Zoo's pair; two at the St. Louis Zoo and four at the Bronx Zoo. They have never bred in captivity in the West, but the Chinese have reported several births during the past decade.

Originally the giant panda was classified as a member of the bear family and was called a "panda bear" or "parti-colored bear." Now it is usually included among the procyonids—the family that includes raccoons, coatis, and lesser pandas. Of these the racoon-sized lesser panda (*Ailurus fulgens*) is probably the giant panda's closest living relative; a pair of these striking russet-colored animals are on display at the Zoo (*number 16 on map*). Giant pandas certainly do resemble bears in several ways. Like bears they are very large, reaching a height of over a yard at the shoulder when standing on all four feet and a weight of over 300 pounds; and they have stumpy bearlike tails.

Less apparent details of their anatomy have convinced zoologists that they should be grouped with the procyonids. In addition, some behavioral differences between pandas and bears are known; for instance, pandas do not hibernate. Like other procyonids, but unlike bears, they have large scent glands under the tail, which probably help the ordinarily solitary adults find one another in breeding season. The zoo visitor will notice such racoon-like features as the giant panda's fur markings, particularly the black eye-rings, and above all the irrepressible playfulness that seems to characterize this family.

The giant panda's diet in the wild consists mainly of bamboo shoots. Each forepaw has a protruding fleshy pad specially adapted for holding bamboo shoots; the claws can be opposed to this pad, so that it functions almost like a thumb. This so-called "sixth finger" is actually an elongated wrist bone. The panda occasionally adds other vegetable matter to its basic bamboo diet and perhaps sometimes eats meat in the wild. In captivity it has proved a most adaptable eater.

Golden Marmosets Born

One of the Zoo's smallest mammals made some of the biggest news, when the golden marmosets (*Leontideus rosalia*) in cage 20 at the Small Mammal Building (*number 15 on map*) gave birth to twins on January 15th. This species is extremely endangered in its native habitat in Brazil, with an estimated total population of 500; and every birth in captivity is a major event. The total number in zoos in the United States is only 70, and ten of these are now located at the National Zoological Park.

A further factor in making the recent birth so important is that the mother was born here several years ago. Almost all captive births of golden marmosets have occurred from matings between wild-caught animals; but if breeding at zoos is going to help save this species from extinction while efforts are being made to establish a protected reserve in Brazil, zoo-bred animals must produce offspring. Six of the Zoo's golden marmosets were born here, and it is hoped that the Zoo will soon be able to produce offspring from pairs of captive-born animals. If this is accomplished, it will be a zoo first.

The family group in cage 20 is interesting to

watch, for it exhibits the unusual way marmoset parents care for their young. The infants—usually two in number like these—spend their first month clinging tightly to the backs of their parents. After the first week, most of the responsibility for carrying the young falls to the father, who transfers them to the mother for nursing. This is an exceptional arrangement for primates, since the young of most species cling only to the mother.

While you are at the Small Mammal Building, be sure to look for the other golden marmosets. They are not only beautiful animals but also very active during visiting hours and interesting to watch. They can often be seen grooming one another in typical primate fashion. At nine in the morning they are fed a specially formulated canned food containing vitamin D-3; and at four in the afternoon you can see them eating the fruits, green vegetables, meal worms, crickets, and young mice that make up the rest of their diet. Marmosets are omnivorous in the wild; they prefer insects or other invertebrates, but also eat some small vertebrates, fruit, and other vegetable matter. Vitamin D-3 is a necessary addition to the diet of captive golden marmosets that do not have access to sunlight, which is important to the growth of this diurnal species. Part of their vitamin D requirement is also made up by periodic brief exposures to an ultra-violet lamp.

Pygmy Hippo Population Increases



Psi, the latest in the Zoo's long line of pygmy hippos, with his mother, Alpha (number 11 on map).

The birth of a pygmy hippopotamus (*Choeropsis liberiensis*) at the Elephant House (number 11 on map) the day after Christmas increased the current NZP population to eight. Six of these were born here, and many members of this rare species born at the National Zoological Park

are now in residence at other zoos. Over the years the National Zoo has had great success with pygmy hippos; since 1925 more than 50 have been born here. The most recent is a male and has been named Psi, continuing the tradition of using Greek letters to name the pygmy hippos, which was presumably arrived at because the more conventional names were running out.

The female Matilda is the oldest pygmy hippo at the Zoo; she was captured in the wild in 1940, already fully adult and weighing 400 pounds (six hundred pounds is about the maximum for this species). Millie, the next oldest, is one of Matilda's many offspring and was born in 1947. The current herd bull, Totota, was captured as an adult in Liberia in 1960; he has sired more than 25 young, including both Psi and his mother, Alpha.

The young of the larger hippopotamus species (*Hippopotamus amphibius*) are born under water, can swim at birth, and continue to nurse under water. Very little is known of the pygmy hippo's behavior in the natural state; but it is believed to be less aquatic than the larger species, and the many captive births at the National Zoo provide evidence to support this theory. The young here are invariably born out of water; even when the mother has been given access to a water tank at the time of birth, she has always chosen to give birth in her cage instead. Sometimes the calf does nurse under water. When it is very young, the swimming tank is only partially filled. Then the mother sometimes lies on her side in the shallow water while the calf is nursing, so that she is half under water and the calf is entirely under water.

Psi weighed nine-and-a-half pounds at birth; by now he weighs over 50 pounds. He will nurse until he is four or five months old, but he began eating some solid food after one week and can now be seen eating alongside his mother at their 3:00 p.m. feeding time.

Keepers at the Elephant House swear that the pygmy hippos are the most intelligent animals in the building. They learn more quickly and thoroughly than any of the others such routines as feeding times, the times when the keepers regularly shift them from cage to cage to clean or to drain their tanks, and the times when they are expected to go outdoors and to return for the night in warm weather. Some

of them—Totota, for example—even learn their names and will come when called.

In the wild their intelligence is well attested; along with their keen senses of sight and smell, it has served to protect them from human curiosity. One early trapper tried to capture live specimens by digging concealed pits in the forest trails each individual hippo uses night after night in its searches for food; these paths, at times so deeply worn that they look more like tunnels, are often the only traces of the pygmy hippopotamus European expeditions ever encounter. In every case, however, this particular trapper found tracks showing that the hippo had walked right up to the edge of the pit, noticed by smell or sight that something was different about its familiar route, and decided to detour around the trap.

Eld's Deer Fawn

At the end of January a brown-and-white spotted Eld's deer fawn (*Cervus eldi*) was born, increasing the Zoo's herd to five (*number 3g on map*). Besides the mother, whose third fawn and first female offspring this was, there are two adult males and one other adult female (the two previous young have been sent to another zoo). The mother can be distinguished from the other hind by the fact that she has small knobs on her forehead like the beginning of antlers, although females of this Southeast Asian deer are not supposed to grow antlers. The other hind, who has been here only since last July, is pregnant now and is expected to deliver her first fawn in June.

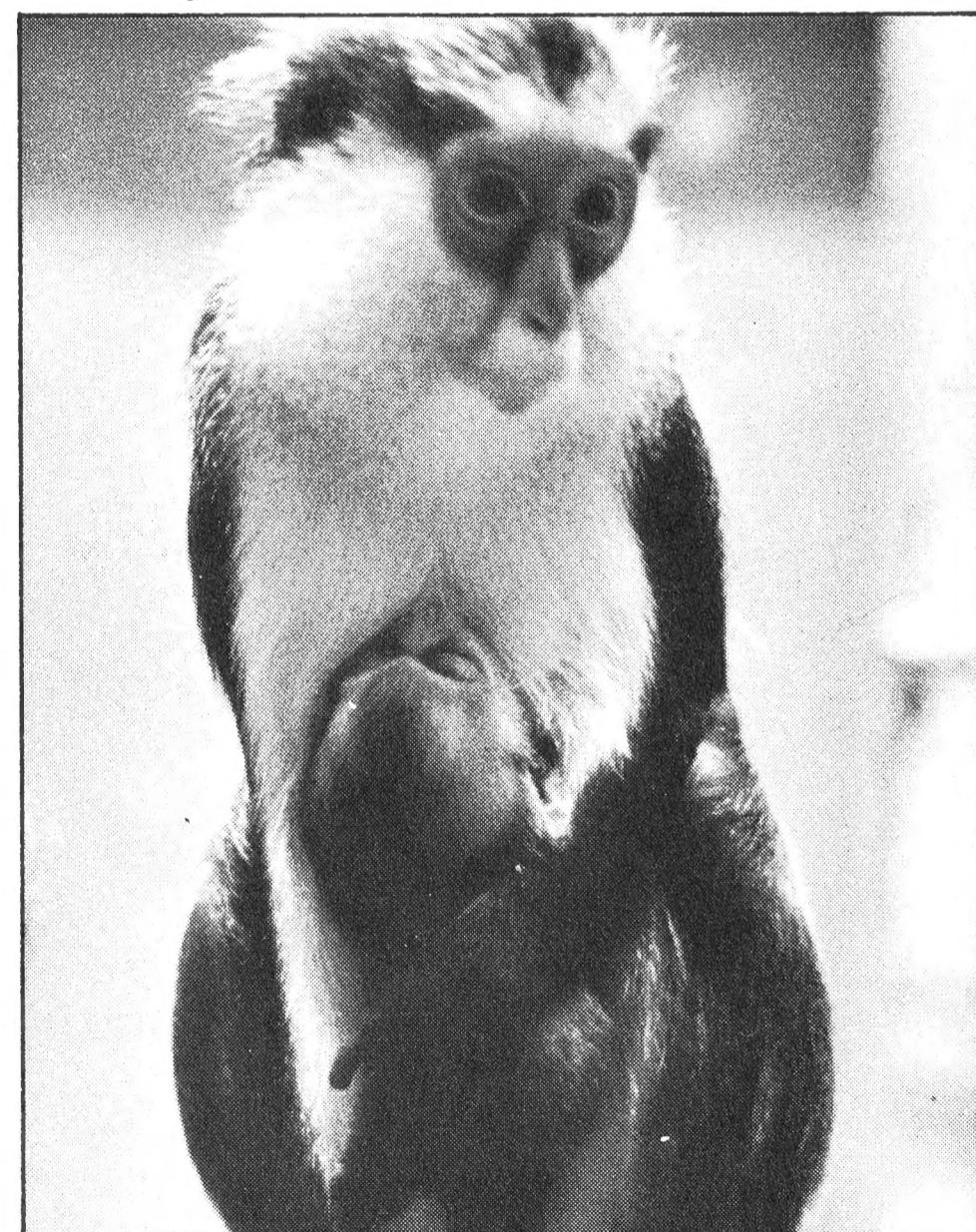
The annual reproductive cycle of deer is one of nature's great dramas. The stag's antlers are grown and dropped each year, and the period when they have reached full growth and the velvet—the soft, blood-rich skin that covers the growing bone of the antler—has dried up and been shed, coincides in most species with the principal mating season.

In the Eld's deer, however, the story is not quite so simple. The Eld's deer stags here reached full antler growth and shed the velvet in December this year; at this writing they have not yet dropped their impressive racks of antlers. Since the gestation period is about eight months and the young born here so far have all arrived in January, this species seems to have a second period of concentrated breeding in the spring.

This second breeding period is unusual for deer, but not unprecedented. More unusual is the evidence that Eld's deer stags may breed throughout the year. After all, the newer of the Zoo's two females is pregnant now, presumably from a mating in October. And records from other zoos show births in virtually every month from September to March, implying mating activity at least from January through July.

The father of the recently born fawn can be distinguished by his larger size and by the double fork on the rear branch of his antlers. He sired the two previous young and is also presumed to be responsible for the current pregnancy. He is the dominant male in mating, and the other stag does not question his position. But, interestingly, the smaller stag seems to be dominant in terms of territory. In dividing up the territory of their paddock, the smaller stag will challenge the larger one and seems to win all such disputes.

Monkey Babies



Two-week-old mona monkey infant, clinging to its mother at the Monkey House (*number 21 on map*).

Two new-born infants can be seen clinging to their mothers at the Monkey House (*number 21 on map*). The Celebes crested macaque (*Cynopithecus niger*) was the first born, on February 9th, and she is the second offspring

of the single pair belonging to the National Zoo. Closely guarded by her protective parents, the baby is difficult to see at first, but close attention will find her clutching securely to her mother's chest, or, when her grip relaxes, hugged by her mother. The species makes its home on the island of Celebes in Indonesia, and though it spends much of its time in trees, it often feeds in the grasslands near forested areas. The adults are very dark brown or black and are distinguished by an extremely prominent ridge over the eyes and a crest of fur at the crown of the head which can be erected when the animal is excited. The infant lacks the characteristic crest and the black or near-black pigment on the naked face and ears.

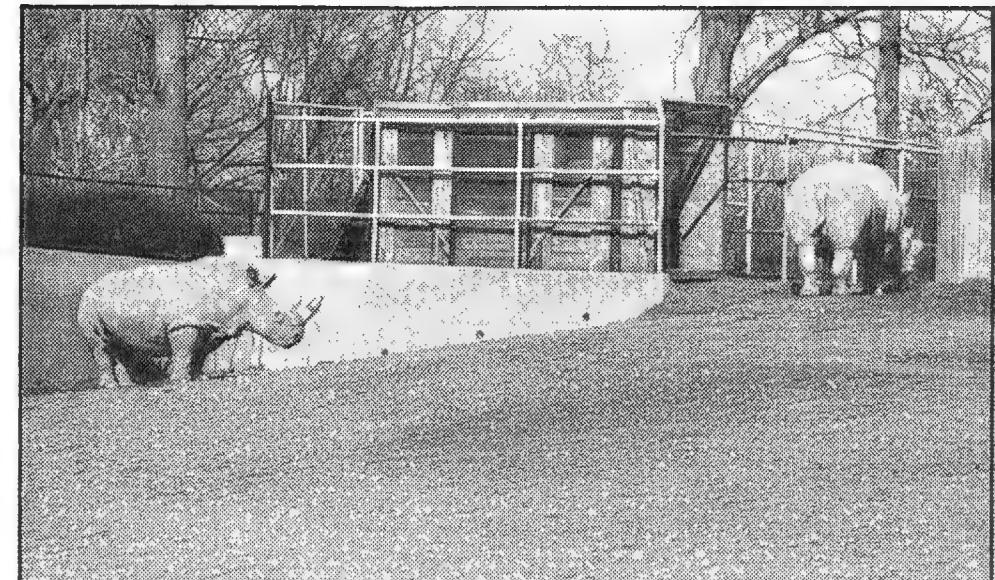
A younger baby in the Monkey House and the newest addition to the Zoo's troop of mona monkeys (*Cercopithecus mona*) is of as yet unknown sex, though it will be two months old on April 18th.

The reason for this mystery is that the baby clings so unrelentingly to its mother that a peek at its backside has been impossible. As the monas are strictly arboreal, this clinging instinct is necessary to keep the young with its mother during her frequent leaps from branch to branch. The baby and mother share their enclosure with father mona and a male juvenile of about one year's age. The family seems to live together harmoniously and with no apparent generation gap, as the juvenile, swinging about the enclosure, occasionally lands on his father's back and rebounds to the bars of the cage. Communal living is the norm for the monas, as in their natural environment in the forests of coastal western Africa they travel in large, noisy groups. Their diet consists almost exclusively of fruits.

Long and thin like so many arboreal monkeys, the mona is distinguished by white fur on its undersides continuing up the neck and forming muttonchops at the jowls. The backs are rich reddish brown and the limbs nearly black. The mother can be heard chirping gently and almost questioningly to her baby. The tail is carried in an elegant arch over the back.

Preparations for a Rhino Shipment

Bill and Lucy, the Zoo's white rhinos (*number 8c on map*), are scheduled to be shipped this spring to the San Diego Wild Animal Park (a new 1800 acre park of the San Diego Zoologi-



Bill and Lucy, the Zoo's white rhinos (*number 8c on map*), with one of the transport crates that will take them to their new home at the San Diego Wild Animal Park.

cal Society) in San Pasqual Valley, California, in hopes that they will breed there. They have not bred since coming to the National Zoo in 1956, when both were about two years old, although another species of rhino, the African black rhinoceros, has bred well at the Zoo. Now it is hoped that the greater physical freedom allowed by a 90 acre enclosure at the Wild Animal Park will stimulate Bill and Lucy to produce offspring at last.

The southern race of the white rhino is adequately protected and steadily increasing, so much so that their numbers are beginning to outstrip the food resources of the few white rhino sanctuaries. The Wild Animal Park and other zoos hope to breed excess animals taken from the wild, in hopes that their descendants can be returned to Africa when further sanctuaries are established. Bill and Lucy belong to the northern race, which is not yet adequately protected; in their case captive breeding is an even higher priority.

Pictured with Bill and Lucy is one of the two transport crates to be used when they are shipped. The rhinos are fed in the crates and will be used to them when the time comes for them to be moved. It is hoped that this process of familiarization will make their trip less traumatic.

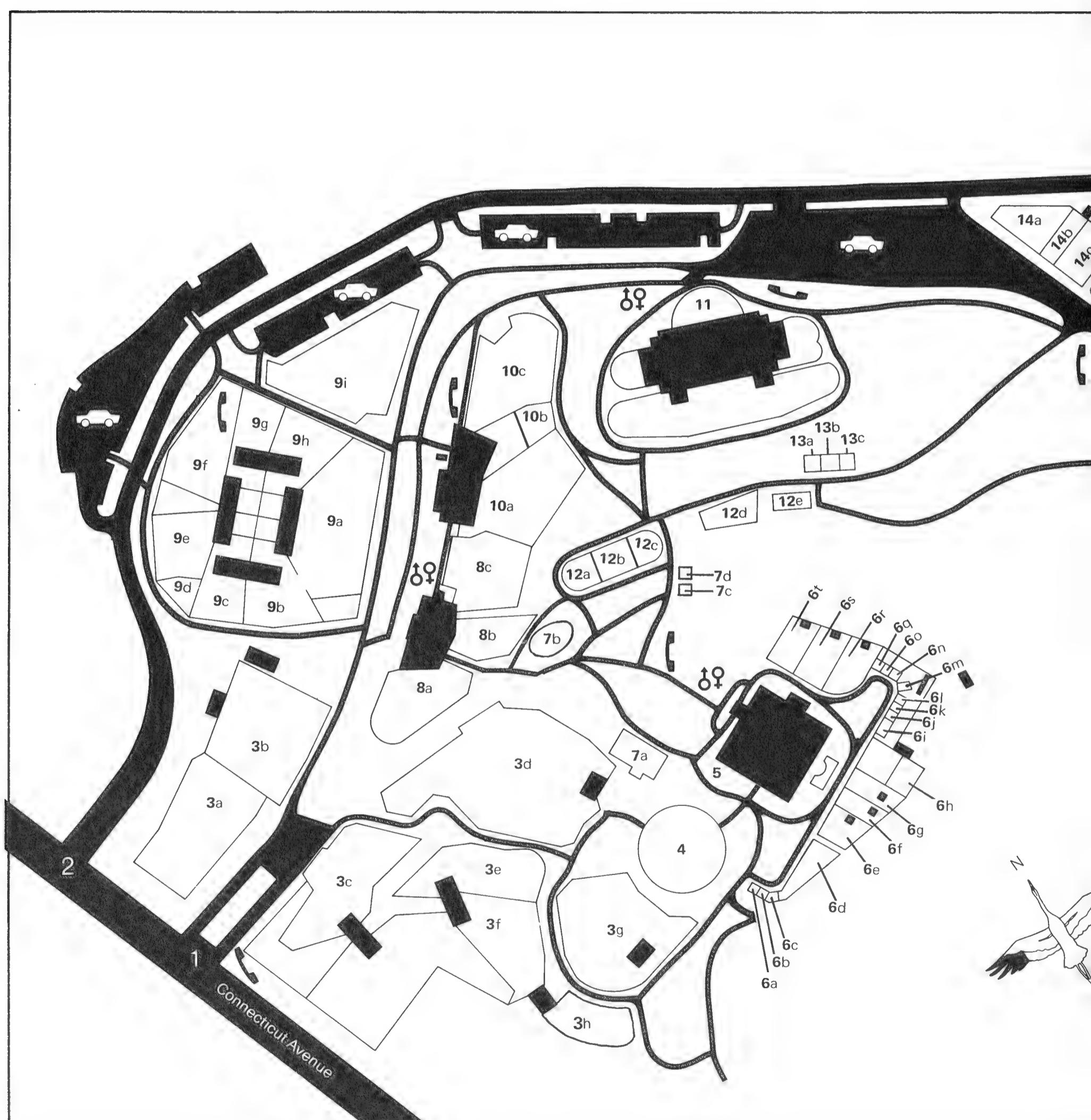
Birds

Rare White Eared Pheasants on Display

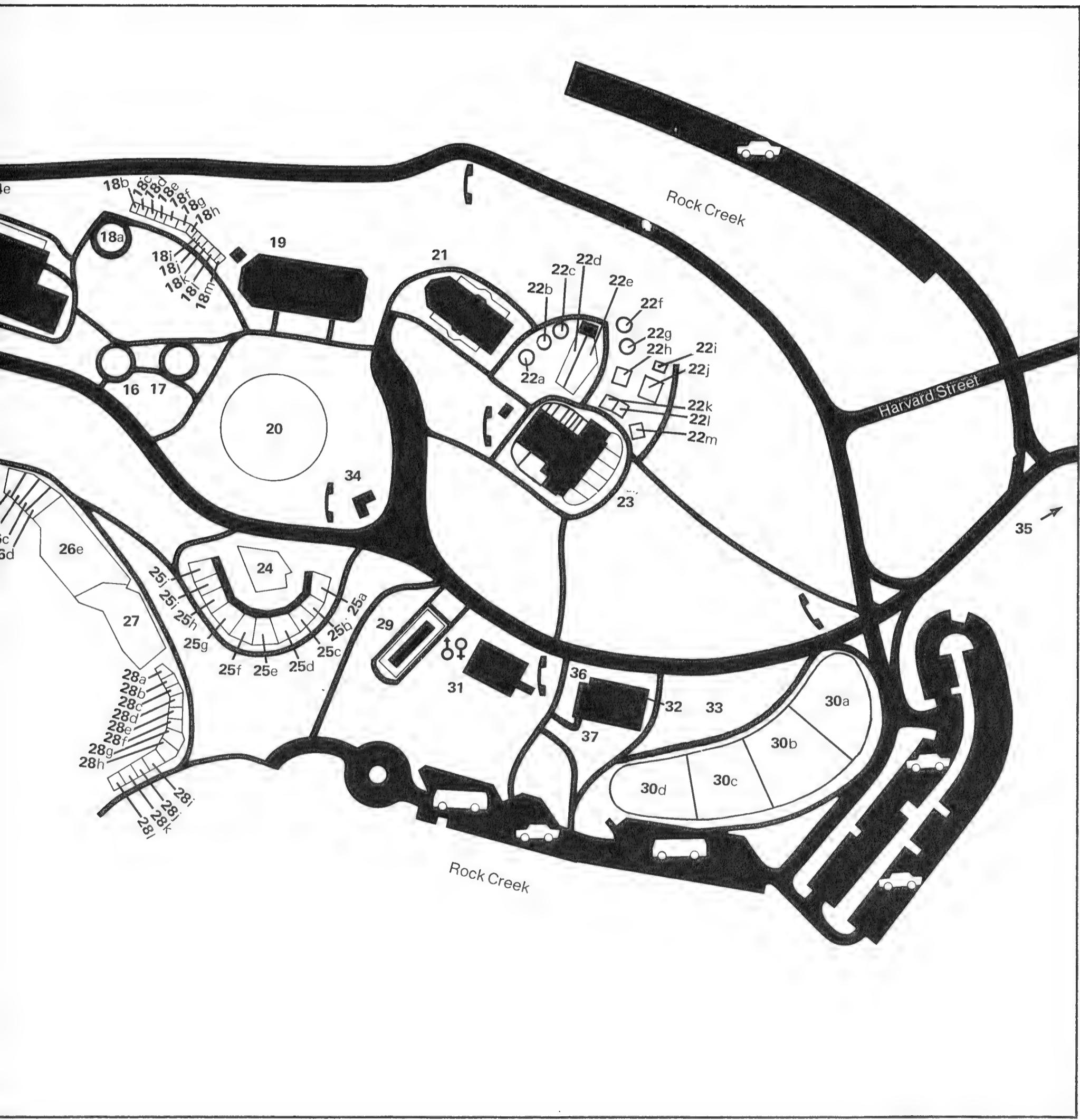
A new pair of white eared pheasants (*Crossoptilon crossoptilon*) is on exhibit in an outdoor enclosure (*number 6m on map*) behind the Bird House. This unusual species is native to a

ZOO MAP

1. Connecticut Avenue pedestrian entrance
2. Connecticut Avenue vehicular entrance
3. Deer and antelope areas (a-h)
4. Great Flight Cage
5. Bird House
6. Pheasant and crane line (a-t)
7. Raptor cages (a-d)
8. Delicate-hoofed stock building (a-c)
9. Hardy-hoofed stock complex (a-i)
10. Panda House (a-c)
11. Elephant House
12. Water birds (a-e)
13. Hawks and owls (a-c)
14. Goat mountain areas (a-e)
15. Small Mammal Building
16. Lesser Pandas
17. Prairie dogs
18. Bears and monkeys (a-m)
19. Reptile House
20. Tortoise yard
21. Monkey House
22. Hardy Animals (a-l)
23. Lion House
24. Komodo Dragon
25. Bears (a-j)
26. Water animals (a-e)



27. Sea Lion pool
28. Wolves, foxes, and wild dogs (a-l)
29. Lesser Cats
30. Waterfowl ponds (a-d)
31. Police Station—Restrooms—First Aid
32. Restaurant
33. Picnic Area
34. Window Shop
35. Rock Creek Parkway entrance
36. Friends of the National Zoo Offices
37. FONZ Education, Editorial, and Tour Guide Offices

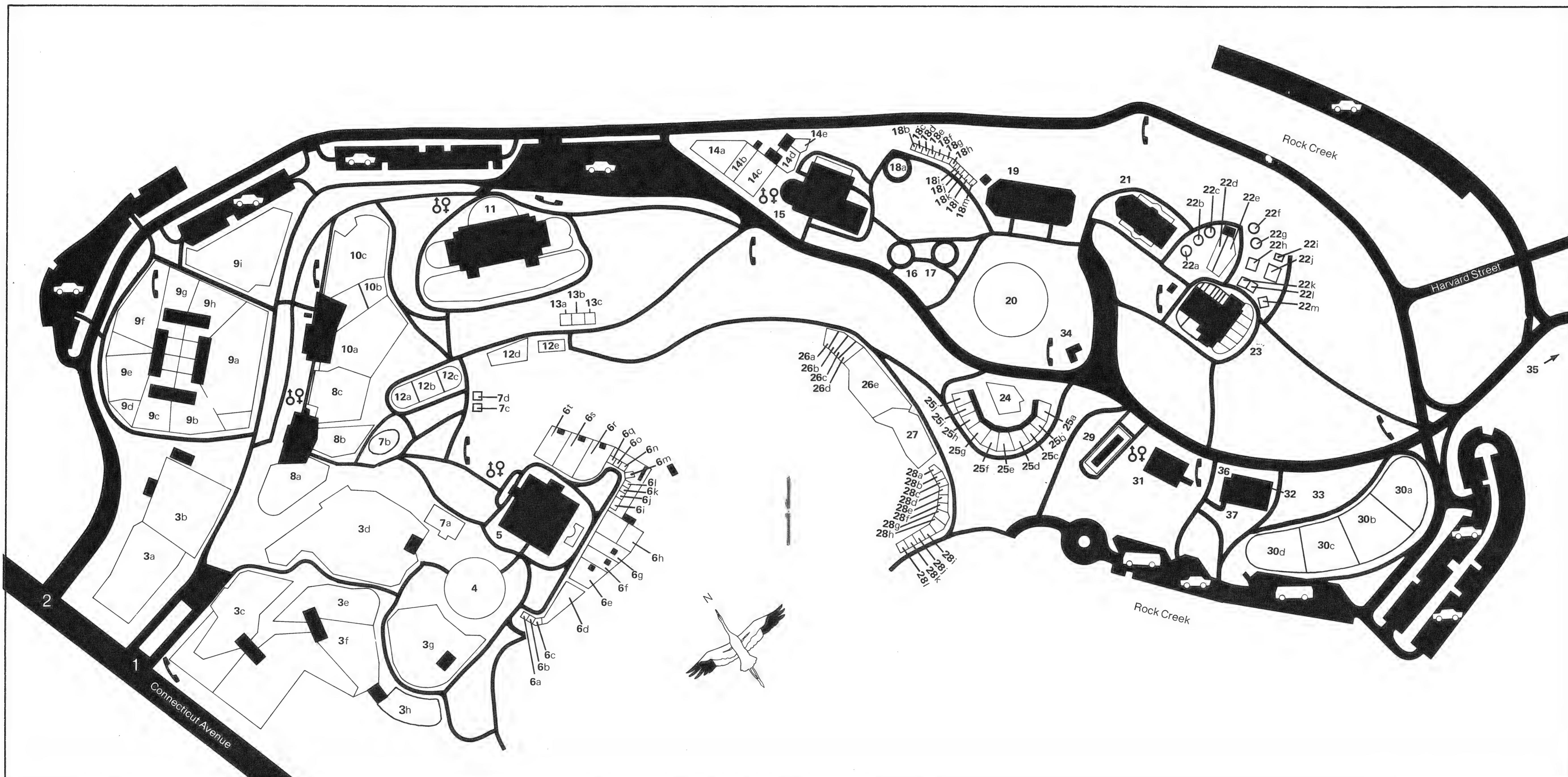
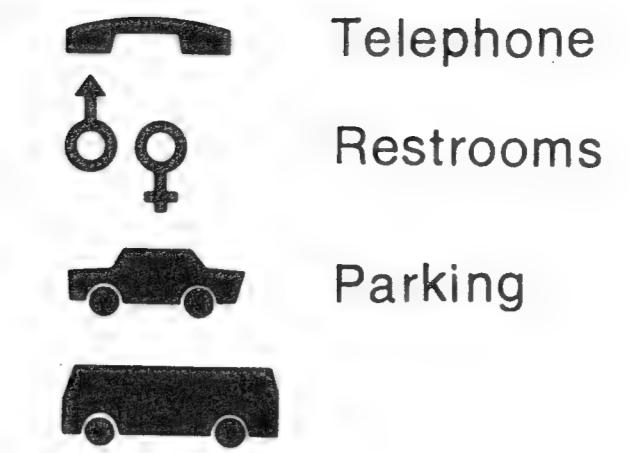


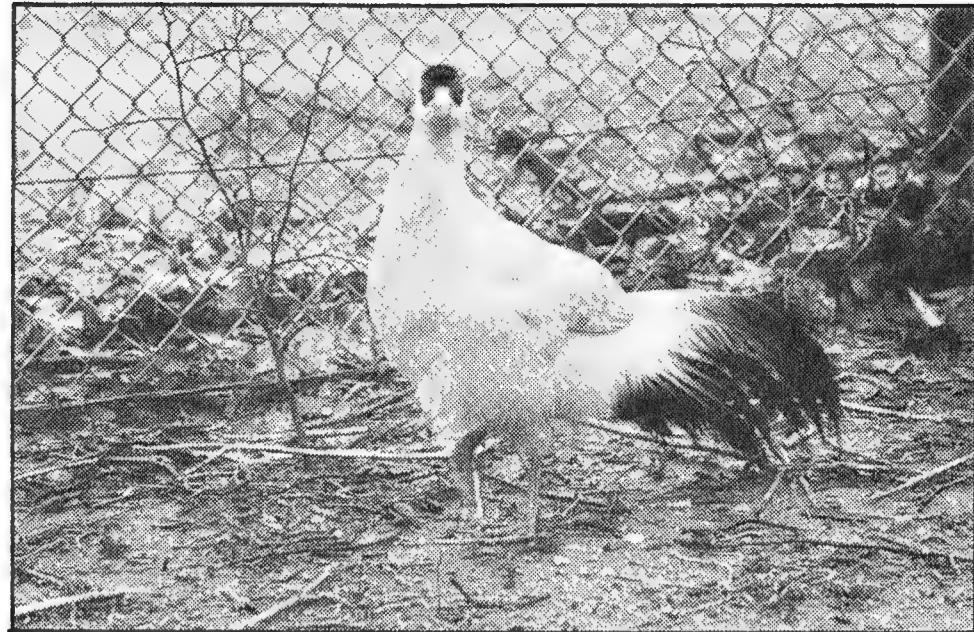
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One of the two new white eared pheasants (*number 6m on map*).

restricted area in Tibet and China and is seldom exhibited in the West. The birds were acquired from the Jersey Wildlife Trust (the zoo of naturalist-author Gerald Durrell) in Jersey, England, where the species has bred well in captivity. Since the status of the white eared pheasant in the wild is not known and may be very precarious, Zoo officials are anxious to breed them here, in order to further increase the small world captive population.

These pheasants are snowy white over most of their bodies, except for the brownish tail feathers and wing tips. The top of the head is covered with velvety black feathers, and there are red patches on the side of the face. They are known as "white eared pheasants," it should be noted, not "white-eared pheasants." The "ears"—actually long feather tufts growing backwards on each side of the head—are white in all members of the genus of eared pheasants, including the blue eared pheasant and the brown eared pheasant; in each case the color name denotes the principal shade of body plumage. All of the eared pheasants inhabit high mountain slopes in Tibet and China. The loose, hairlike texture of the white eared pheasant's long body plumage is a readily observed adaptation for the cold climate in which it lives.

The golden pheasant, Swinhoe's pheasant, and Hume's bar-tailed pheasant in surrounding enclosures provide examples of the striking contrast between spectacular males and dull-colored females that is typical of pheasants (*numbers 6o, 6n, and 6k on map, respectively*). The eared pheasants are unique in that the sexes are virtually indistinguishable. In the white eared pheasant the only differences are that the male is slightly larger, has a short heel spur on the back of each leg, and has somewhat larger and

rounder red patches on the side of his head. These red areas are covered with small fleshy projections that the male erects during his courtship display.

When the male of a bird species courts and breeds with as many females as possible each year, there is often a marked contrast between the sexes. This is particularly true among the *Phasianidae*—the family that includes pheasants, peafowl, and domestic chickens. Unlike most members of the group, the eared pheasants are monogamous. Their flocks separate in pairs in the breeding season, and reportedly mates are chosen with a good deal less quarrelling among males than ordinarily takes place in most of the *Phasianidae*. They lay their four to seven eggs on the ground in simple nests loosely scraped together from grass and other debris. The young are said to be brown on the back and yellow on the underside, head, and neck.

The eared pheasants are also unusual in their feeding habits. They dig for roots, tubers, worms, and grubs with their relatively long and hooked bills. By contrast, most other members of the family scratch for food with their feet like domestic fowl.

An Unusual Parrot Acquisition



Rare Patagonian burrowing parrots at the Bird House (*number 6 on map*).

The Patagonian burrowing parrots (*Cyanoliseus patagonus*) are also new arrivals, located in a cage behind the Bird House (*number 6q on map*). These dark olive-colored birds with yellow undersides and red breasts not only lack the bright plumage characteristic of tropical parrots, but are even more remarkable for their nesting habits. Most parrots nest in cavities in trees; in captivity nest boxes provide an acceptable substitute, as they did for the turquoise parrot young recently reared in cage 7. The

Patagonian parrots, on the other hand, nest in holes in sandstone cliffs, sometimes four to five feet deep. At the Bird House a special rock pile has been assembled, with a deep crevice in between the rocks for nesting.

These parrots nest in large colonies, and the burrows are often interconnected underground. They live in the burrows throughout the year. Large groups go out to feed together and return together. Just before returning to the cliff site, the group is reported to separate into smaller "squadrons" of up to a dozen; all of the members of each squadron beat their wings rapidly to pick up speed, then glide—almost "in formation"—straight into their individual burrow entrances. The habit of nesting in colonies has not been advantageous in protecting the burrowing parrots from man. Young birds have been captured so often from their nests to be raised as pets that the species seems to be gradually dying out.

The red-winged tinamous (*Rhynchotus rufescens*) sharing this enclosure are also new. Like the Andean tinamous (*Nothoprocta pentlandii*) in cage 12, these birds look like partridges or quail but are thought to be more closely related to the rheas (*number 6h on map*). The red-winged tinamou occurs in the parts of South America to which the burrowing parrots are native.

Burrowing Owls



Burrowing owls in cage 26 at the Bird House (*number 5 on map*); the slightly different markings on these birds probably represent racial differences between populations inhabiting different parts of the burrowing owl's range.

The Bird House (*number 5 on map*) has added a second member of another burrow-nesting species, the burrowing owl (*Speotyto cunicularia*), and keepers have built several underground nesting sites for them in cage 26. It is not yet known, however, whether the two are actually a male and a female. Since there are

no plumage differences or size differences between the sexes, behavior is the only way to distinguish the sexes of burrowing owls. In this unusual owl, the sexes are alike; the slightly different markings of the two birds at the Zoo probably represent racial differences between different populations from different parts of the burrowing owl's extensive range. It is hoped that mating behavior—and eventually, eggs and young—will settle for the question of these bird's sexes.

The temperature and humidity in cage 26 are controlled to imitate the dry climate of the treeless prairies of the American West. In that region, burrowing owls are famous for their habit of taking up residence in unused burrows on the outskirts of prairie dog towns. Legend has exaggerated the amicable relations between the owls and the prairie dogs; actually, the owls probably sometimes feed on prairie dog young and, in turn, may be robbed of an occasional egg by the rodents. Burrowing owls also live in Florida, the West Indies, and South and Central America; these populations, like the isolated one in Florida, must often dig their own burrows. They are said to be able to do so quite well. The ends of the burrows, where the six to eleven eggs are laid, are lined with grasses or horse and cow manure to a thickness of one to two inches.

Reptiles and Amphibians

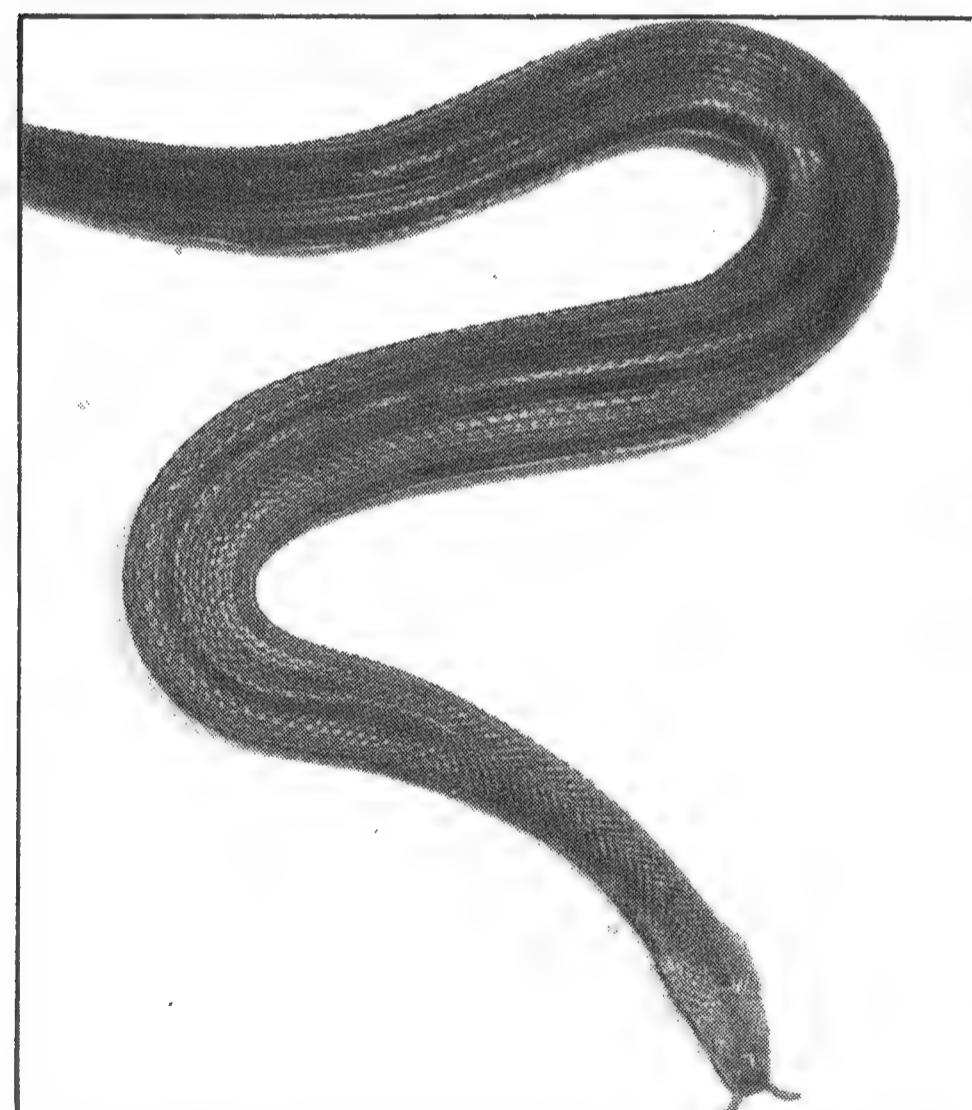
New Matamata Turtle Exhibit

New exhibits recreating natural environments and illustrating aspects of the animals' lives in the wild continue to be built at the Reptile House (*number 19 on map*). One of the newer ones is the matamata turtle (*Chelys fimbriata*) exhibit in cage D8. These large and unusual turtles have been moved to a new leaf-and-branch-filled tank that is designed to emphasize the very effective use they make of camouflage in the river bottoms of Colombia and the Guianas. Their new surroundings are not only informative to the visitor, but also seem to be having a good effect on the turtles, since mating

behavior has been observed in the new tank.

The matamata turtle's long neck and broad, flat head are covered with numerous fleshy projections that make the turtle look like nothing so much as a pile of leaves. The protuberances not only disguise the matamata from the small fish on which it feeds, but evidently attract them, appearing to the fish to be edible refuse. This turtle's extremely wide mouth lacks the sharp, horny edges characteristic of the mouths of other fish-eating water turtles like the snapper or the soft-shelled turtle. When any suitable prey approaches its vicinity, the matamata simply opens its mouth and distends its throat greatly. Water rushes into the turtle's mouth, bringing with it the unsuspecting fish.

Tentacled Snake



The unusual growths on the tentacled snake's head are tactile organs (number 19 on map).

The tentacled snake (*Erpeton tentaculatum*) new on exhibit in the F section in the Reptile House is an unusual totally aquatic fresh water snake. Its tail is a good deal thinner than the rest of its body and is prehensile; in the mangrove swamps of Southeast Asia where it lives, the tentacled snake evidently anchors itself to an underwater branch by means of its tail

while waiting for the fish on which it feeds to swim by. The tentacles on its snout are probably used as tactile organs to find fish in murky swamp waters.

While the snake is submerged, its nasal passages can be tightly closed. The tentacled snake is not venomous and is reputed to be quite docile. It bears its young live, in the water, up to a dozen at a time.

Giant Snakes



The common anaconda, or water boa, one of the world's two largest species of snake (number 19 on map).

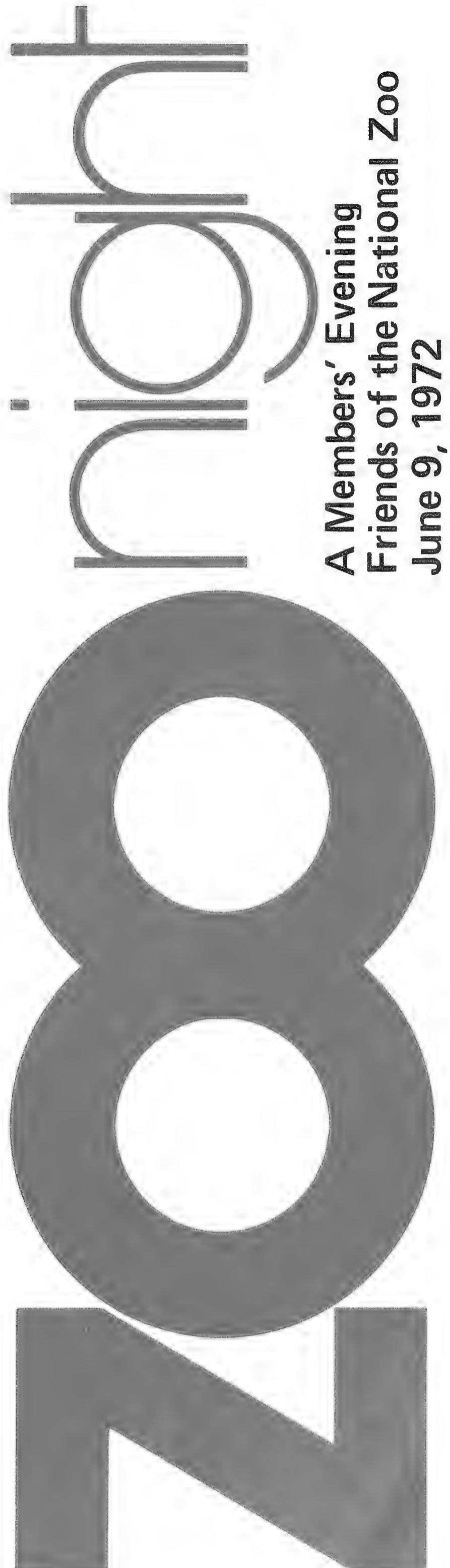
Which living species of giant snake merits the title of the largest is a common subject of contention among herpetologists. The reasons for the controversy are two-fold. First, through a fear of large snakes that is either innate in man or has been firmly established by long years of cultural conditioning, the eyes of even the most would-be-accurate witness tend to measure larger than his tape measure would. Second, the largest snakes are often killed and not measured accurately before being skinned, and when the skin is removed it is inevitably stretched.

An anaconda skin of 40 feet is not unusual, though a living specimen of that length would break existing records. Thus, both of the two front runners for the title of the largest living snake, the reticulated python (*Python reticulatus*) of Asia, and the common anaconda (*Eunectes murinus*) of tropical South America have been called the largest; a final decision depends only upon which source one chooses to consult.

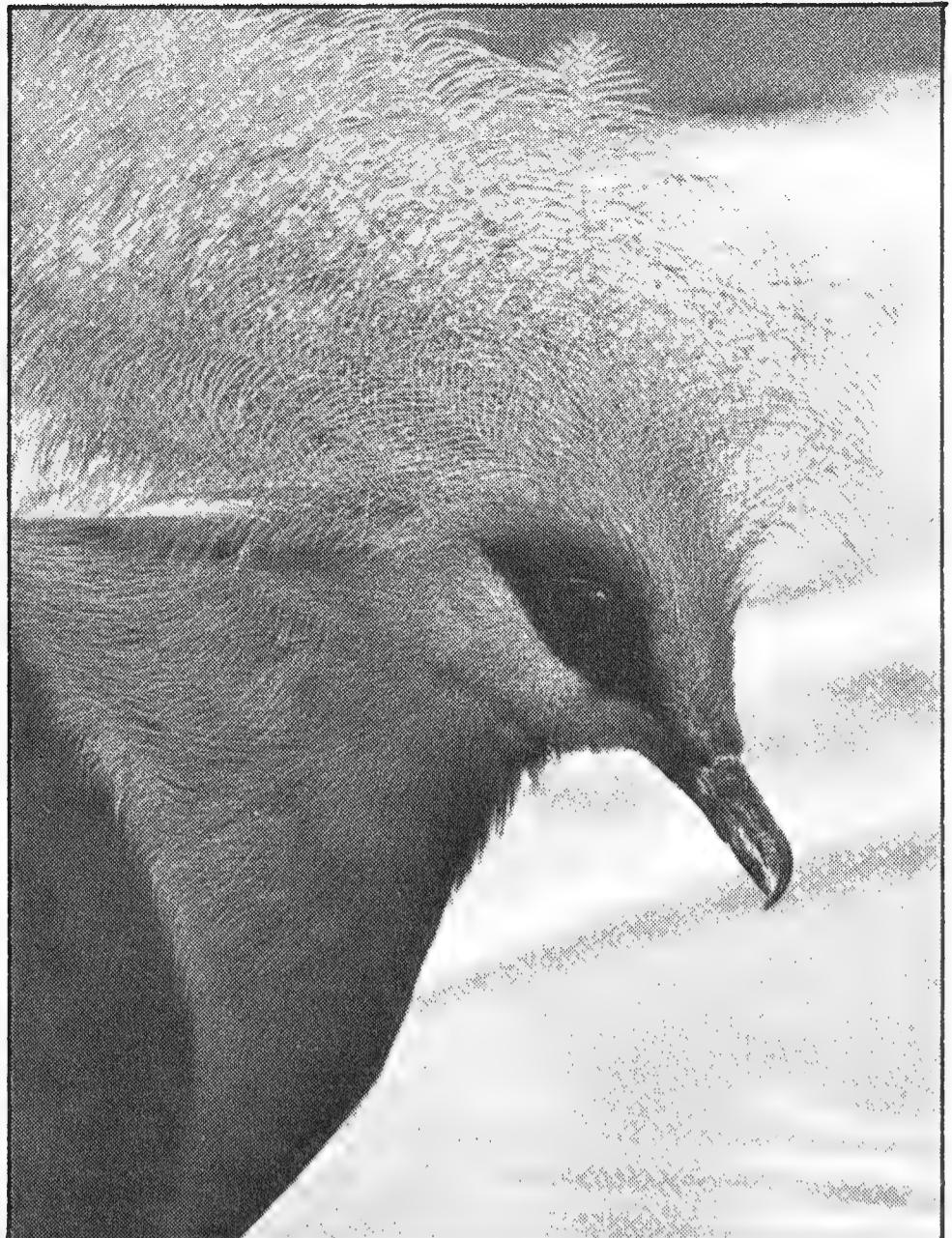
It is generally agreed, however, that the anaconda, or water boa, is the heaviest, if not the longest, of the giants. In February of this year, the Reptile Division received a ten-and-a-half foot specimen of this species, which can be seen sharing enclosure D3 with its rival for the title, a reticulated python. At the Zoo, the reticulated python is the larger, measuring about 18 feet and with a considerably greater girth than its South American cousin, and there are records of these pythons growing up to 33 feet. These two species are examples of the two subfamilies of the family *Boidae*, or giant constrictors. The anaconda is a member of the same subfamily (*Boinae*) as the boas; almost all of the *Boinae* are snakes of the New World tropics that bear their young live. The reticulated pythons are members of the subfamily *Pythoninae*, which are Old World snakes and egg layers. Though often found near water, they are not aquatic.

The anaconda is dark green to yellow with black or blackish spots and is thus well camouflaged in the swamps which are its preferred habitat. Generally considered a nocturnal reptile, the anaconda often leaves the water during daylight to sun itself in waterside trees. It is primarily solitary, but there are reports of congregations of the giants; as many as eleven have been seen clustered together on a river bank. The reasons for these congregations is unknown.

Like all the giants, the anaconda can fast for an extended period. Much of its food is itself aquatic, including fish, turtles, and water-fowl, but its diet also includes deer, peccaries, large rodents, sheep and dogs. Huge meals of single large prey are not uncommon and remains of a 100 pound peccary and, in another instance, of a six foot caiman have been found in stomachs of anacondas; in each of these cases the predator measured over 25 feet.



A Members' Evening
Friends of the National Zoo
June 9, 1972



Pigeons and Doves

by Austin Hughes

Pigeons and doves, as visitors to the Bird House will discover, come in a great variety of sizes and colors. The common crowned pigeon (*Goura cristata*, located in cage number 22 to the right of the main door of the building) is one of the three largest species in this group of birds. The diamond dove (*Geopelia cuneata*) and the cape dove (*Oena capensis*), around the corner in cage 20, are two of the smallest. Except for their plumper bodies and much longer tails, they are no bigger than sparrows. The species in the indoor flight room illustrate the brilliant plumages characteristic of the many tropical and subtropical forms. The bleeding-heart pigeon (*Gallicolumba luzonica*), with the bright red patch on its white breast, is unmistakable. The emerald dove (*Chalcophaps indica*) is about the same size as the familiar pigeons of our cities; but its throat and underside are brown, its wings are deep green, its head is white, and its bill is bright orange.

The yellow-breasted fruit dove (*Ptilinopus occipitalis*) and the Nicobar pigeon (*Caloenas nicobarica*), also located in the indoor flight room, are larger species. The former is spectacularly colored, with a dark magenta and white head, a green back and wings, and a white throat and neck. The name "yellow-breasted" is somewhat misleading, since the breast feathers may appear crimson, as they do in the birds at the Zoo. The Nicobar pigeon is a glossy greenish-and-coppery black, with a charcoal grey head, a mantle of longer feathers around the neck, and a white tail.

There is no strict ornithological difference between pigeons and doves; all are members of the family *Columbidae*, a remarkably successful group that inhabits every continent but Antarctica and many ocean islands. More than half of the nearly 300 species inhabit Australia, Indonesia, and the southeast portion of Asia from India to the Philippines; almost every species on exhibit at the Bird House is native to one of those areas. The English word "dove," of Anglo-Saxon origin, is conventionally applied to the smaller, more graceful species; "pigeon" is derived from the Norman French and is most often used of the larger, heavier forms. But the terms overlap, and for convenience the *Columbidae* are frequently referred to as "the pigeon family" in ornithological literature. And, as varied as the members of the family are in some respects, they are all readily recognizable as pigeons.

The best known of the *Columbidae* is, of course, the common pigeon of our cities. These birds are descended from domesticated breeds of the European stock dove or rock dove (*Columba livia*). This species, first domesticated by man about 5,000 years ago, was originally raised as a source of food, and, later for its remarkable homing abilities. Some of them reverted to the semi-wild state in which they are now so familiar, and these birds are usually referred to as "feral pigeons" or "feral stock doves". ("Feral" is a term used of free-living populations of previously domesticated animals.) They exhibit not only the typical pigeon body form but also the hardiness and adaptability that characterize most of the family. Moreover, many behavioral patterns common to all pigeons can be readily observed among the feral pigeons of our parks and public places.

One of these is the peculiar head-bobbing pi-

geon gait. Close observation shows that the pigeon is actually thrusting its head forward just before each step and keeping the head steady while the body in effect catches up to it. This allows the pigeon an instant of steady vision, unblurred by motion, before every step it takes and thus can be of considerable value for birds that spend a lot of time on the ground, as do feral pigeons and many other members of the family. Another familiar trait belonging to all pigeons (which they share with the other living family in their order, the sand-grouse) is their unique method of drinking. They are able to lower their bills below the surface to suck up water. Unlike other birds, they do not have to tilt their heads back so the water can run down their throats to where it can be swallowed.

Other, more complex behavior patterns that appear throughout the family can also be observed among feral pigeons. It is not unusual in springtime, for instance, to see a male pigeon following his chosen female along a sidewalk, his throat expanded and his neck plumage erected in a way that makes his ordinarily rather drab-looking neck feathers iridescent. Meanwhile he may make the repetitive "cooing" call that is found in virtually every member of the family. If the male is courting the female for the first time and she is receptive, she will stand still eventually; and, still cooing softly, he will execute a series of pronounced bows, each of which ends with his head lowered so that the erected plumage on the back of his neck is visible to the female. Every pigeon species studied to date has a courtship ritual similar to this "bowing display" of the common feral pigeon. The species with more exotic plumage seem to have more exotic courtship rites; and, in fact, most of their brilliant colors—and such unusual feather conformations as the crowned pigeon's "crown"—appear to have evolved as ways of enhancing the courtship display. Distinctive plumage and distinctive ways of displaying it to the female are advantageous not only as means of announcing to the female that the male is of the same species and in breeding condition, but also as ways of stimulating her to breed by bringing her seasonal reproductive drive in close harmony with the male's corresponding urge.

Thus in the spotted dove (*Streptopelia phoenicopetra*, on exhibit in the indoor flight

room), the male expands his throat and breast, lowers his wings and ruffles out his pale green body feathers, then repeatedly bows his head and makes a unique whistling sound as he walks up and down a branch towards and away from the female. In the bleeding-heart pigeon, the display culminates with the male's head thrown far back and his breast expanded to an incredible size, displaying the red patch to fullest advantage.

Many birds have elaborate crests like that of the crowned pigeon, and these head adornments are usually used in courtship display. Thus scientists have been led to wonder which came first—the crest or the display. The pigeon family are one group in which the answer to this question is not hard to find. Since the crowned pigeon's crest finds its primary use in the bowing display, a behavior pattern shared with all other pigeons, it seems obvious that the bowing display came first in the evolutionary sequence. The ancestors of the crowned pigeon and those of other pigeons must have inherited the rudiments of this courtship ritual from a common ancestral source; subsequently—as the other pigeon species did, each in its own way—the crowned pigeon evolved its special plumage in order to make its courtship more impressive and therefore more effective. Thus, each bow culminates with the male's head almost directly upside down, so that the crest faces the female; sometimes the neck may be slightly twisted, showing the crest at least partly from the side. One bright red eye, contrasting vividly with the pale blue of the head and crest, is then also visible.

The spinifex pigeon (*Lophophaps plumifera*, on exhibit in cage 7) is a smaller species that has also evolved a kind of crest for its courtship. The long feathers on the Nicobar pigeon's neck and shoulders—or "hackles" as they are called by analogy with somewhat similar feathers in domestic fowl—are another adornment used in the bowing display. Unfortunately, no detailed account exists of exactly how they are used.

If the female is receptive, the bowing display may be followed by other behavior patterns that seem to be fairly standard throughout the family. One of these is "billing"—which from its familiarity in feral pigeons has become proverbial. Billing usually follows a short period

in which the male pauses in his courtship to preen his own wings, thus evidently reassuring the female of his non-aggressive intentions. Then the male will present his bill to the female, and she places her bill inside his and may be fed by him. The male does not usually regurgitate food as a pigeon would in feeding its young, but both birds make regurgitating motions. Like the courtship feeding of many other birds, billing symbolically places the female in the dependent position young have relative to their parents and thus increases the male's dominance over her.

Bird courtship procedures involve many elements that now seem entirely ritualized but earlier in the evolution of the behavior pattern must have been motivated by urgent, non-ritual needs. Part of the process of accounting for the form these complex behavioral patterns take is to look for the original motivation of each component. This sort of analysis has been attempted for some aspects of pigeon courtship; the picture it presents seems to indicate that, in the distant past, the courtship of the *Columbidae* was not the polite affair it usually is today. The bowing ritual itself, it has been theorized, may have originated in a crouching posture by which the male readied himself to leap or fly at the female and take her by force if need be. Its stylized repetition, however, evolved to convince the female that the male was not going to engage in any so overt aggression, while still reminding her that he very well could.

Along similar lines, the diamond dove has developed a unique courtship "dance" that illustrates excellently how a threat of aggression can be transformed by evolution into a highly ritualized performance. After a preliminary wing-lifting display and, usually, some billing, the male mounts the female, utters a single coo, then dismounts abruptly, at once gives a loud cry, and strikes at the female's head with one of his wings. But the female seems to have known what was coming, and she ducks adroitly, just avoiding the blow. The pair thereupon resume billing for a few seconds. The male mounts the female once again and once again dismounts, cries, and strikes at the female, this time with the other wing. Once again the female crouches in time. On the third mounting copulation takes place; immediately thereafter, the male rushes at the female as if to attack her. She avoids

him by flying about a foot away. After that, there is no aggression on either side, and the pair are as affectionate as doves are traditionally supposed to be.

Many aspects of pigeon courtship seem to indicate the very opposite of aggression on the part of the male. One of these—the tendency of the male to pause at some point in the proceedings and preen himself—has already been mentioned. In some species, as in the emerald dove, the male accompanies the bowing display with a wing display, raising his still-closed wings over his back and revealing their undersides, which may be distinctively marked. This ritual serves the same function as other displays of plumage; but in its original form this behavior was possibly the same as the posture assumed by a bird about to fly off and may have indicated a real impulse to fly away on the part of the male. This sort of ambivalence in the male's motivations may have helped decrease the female's fear and defensiveness, just as a certain amount of hesitancy can do on the part of a human lover.

Most of the *Columbidae* are forest-dwellers, nesting and roosting in trees. But there are species, like the diamond dove, that inhabit more open country; and a few species roost and nest on cliffs. Even among forest-dwelling species, a great many pigeons and doves do most of their feeding on the ground. The Nicobar pigeon, the bleeding-heart pigeon, and the crowned pigeon are all regularly ground-feeders in the wild; but all of them return to trees to roost and to build their nests.

Tree-nesting pigeons construct loose platform nests of twigs and stiff grasses at a height of thirty feet or lower. Four times in the last year, the Nicobar pigeons in the indoor flight room have built their shallow nests on a dead branch hanging on the east wall of the room. They add to the nest while incubating, so that by the time the single egg hatches, the nest is much sturdier and the young bird is not visible. The emerald doves also have recently revealed some fascinating nest-building behavior there. The female was observed sitting on the beginnings of a nest spread across the flat top branches of a pine sapling. The male would fly over at intervals bringing new nesting materials. Upon landing he would stand on top of the female's back and pass the single twig or straw he had gathered into the

Future Plans

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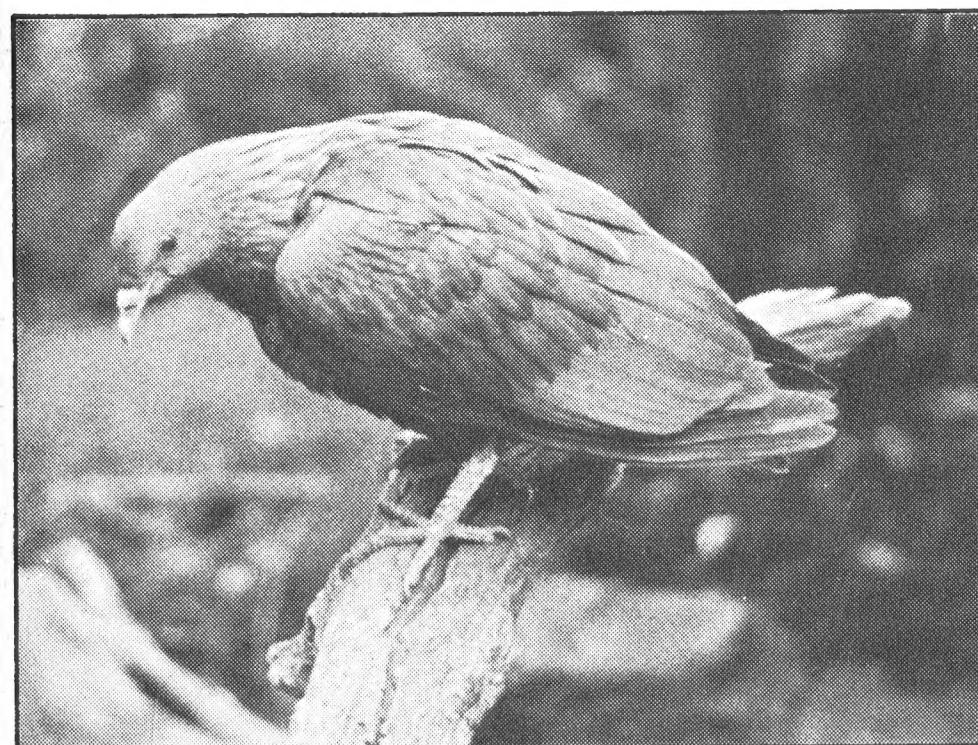
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This young Nicobar pigeon was hatched at the Bird House. The juvenile lacks the white tail and long mantle of shoulder feathers that are so noticeable in the adult.

female's bill. The female would add the new piece to the nest, and about a minute afterwards the male would be gone in search of another.

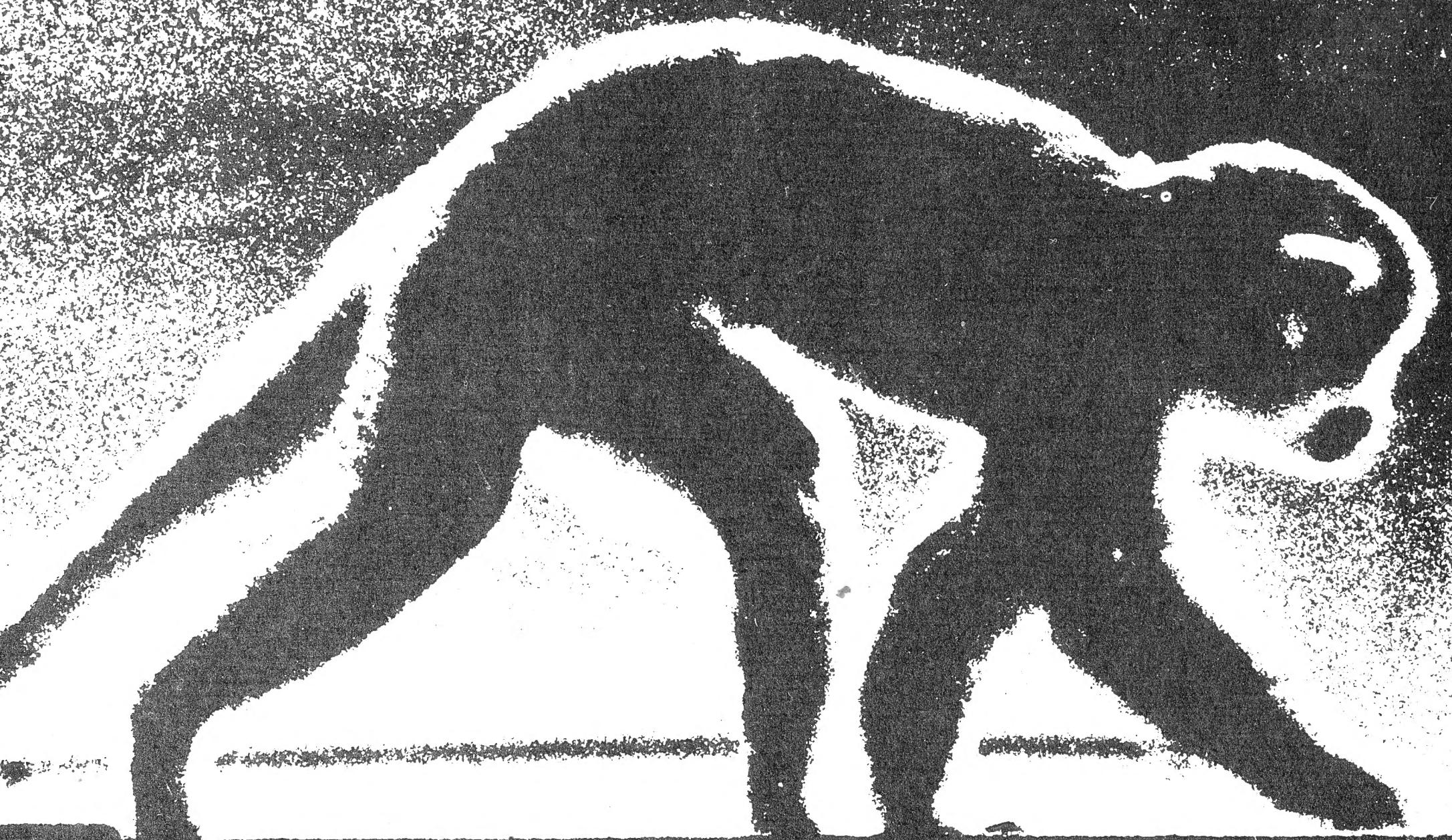
Like the feral pigeons, many species are highly gregarious. Some are colonial nesters; but all species separate in monogamous pairs at breeding season, and often each pair defends a nesting territory. But even among territorial nesters, there are often traditionally established parts of each population's feeding range where the birds can gather to feed or drink without conflict even in the breeding season. The male chooses the nest site, usually before he finds a mate. On selecting it, he gives a distinctive call, advertising the fact to females and other males. In the yellow-legged green pigeon, he does this in a crouched position with the tail spread. After successful courtship and copulation, the male leads the female to his chosen nest site, and he or the female may then repeat the distinctive call that announces their occupation of the site. If the male has not already chosen a nesting site, it is at this time he does so. But there is evidence in at least one species, the wild stock dove (*Columba livia*), that females will reject a male's courtship if he does not already have a nest site.

One of the most dramatic aspects of pigeon behavior is usually associated with the nesting site. This is the display flight, in which a male suddenly flies up above the trees or cliffs—or, in the case of feral pigeons, the buildings—and away from the nesting site, announcing his presence and the fact that he is in breeding condition to members of the

same species throughout the surrounding area. In some species the flight is characterized by alternating periods of leisurely gliding and of rapid wingbeats and is punctuated by several short sequences of loud wing claps. This behavior can take place both before and after the male has found a mate, usually when another pigeon of the same species is observed in flight in the area, especially if the other bird is also in display flight, when the male has just returned to the nest site, or immediately after copulation. While this behavior has been recorded for only a few common European and North American species, experts believe that it may occur throughout the family. If it does occur in such species as the yellow-breasted fruit dove, it must be truly impressive.

All of the *Columbidae* lay one or two eggs. For the first three or four days of life the young are fed by a method unique to this family. When the eggs are ready to hatch, both parents begin to produce a substance known as "pigeon's milk" from the lining of the crop, the throat sac birds use to store food for their young. This substance looks and smells like cheese and is similar to mammalian milk in its high fat and protein content. After about the fourth day of life, the parents begin to mix solid food with the "pigeon's milk".

The only native wild pigeon in the Washington area is the mourning dove (*Zenaidura macroura*) which is fairly common in Rock Creek Park. (There are also two of them in the Great Flight Cage at the National Zoo; it may be hard to tell them from the spotted doves at a distance.) This species is found throughout North America, sharing its range with several other members of the family in Southern and Western regions. Like feral pigeons, mourning doves may start breeding in February and raise three or even four broods from that time through early summer; so pigeon-watchers should have many opportunities to look for characteristic breeding behavior in this species. In display flight, for instance, the male mourning dove flies almost directly upward for 100 feet or more, then glides back down in a series of leisurely arcs. And, of course, the connoisseur will not want to miss frequent visits to the National Zoo's Bird House, where a great deal of varied and intriguing behavior—most of it in species virtually unstudied in the wild—awaits dedicated observers. ■



zoo night

A Members' Evening
Friends of the National Zoo
June 9, 1972

The Friends of the National Zoo Night is the highlight of the season for its members. It's a family and friends picnic night, after hours on the Zoo grounds, with free soft drinks and beer provided. A "behind the scenes" tour is featured,

along with baby animal visits, this year starring the twin orangutans. The giant pandas will be a must, and we hope to have the architect's model of the new Master Plan for the Zoo on hand. Dr. Bernhard Grzimek, famous nature writer and Director of the Frankfurt (Germany) Zoo is planning to attend, and we hope to unveil a special

exhibit of wildlife photography that evening. There will be free train rides for the children and much more. Do come; if you're not already a member, join the Friends of the National Zoo now by filling out the application insert in our THE ZOOGOER magazine.